Junior Computer Science

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Angles of 2D Shapes

Program Aim Can the user follow pseudo code text instructions to create a program that investigates the angles of 2d shapes. Can the user then use this to discover the angles of regular 2D shapes

Computer Science Concepts
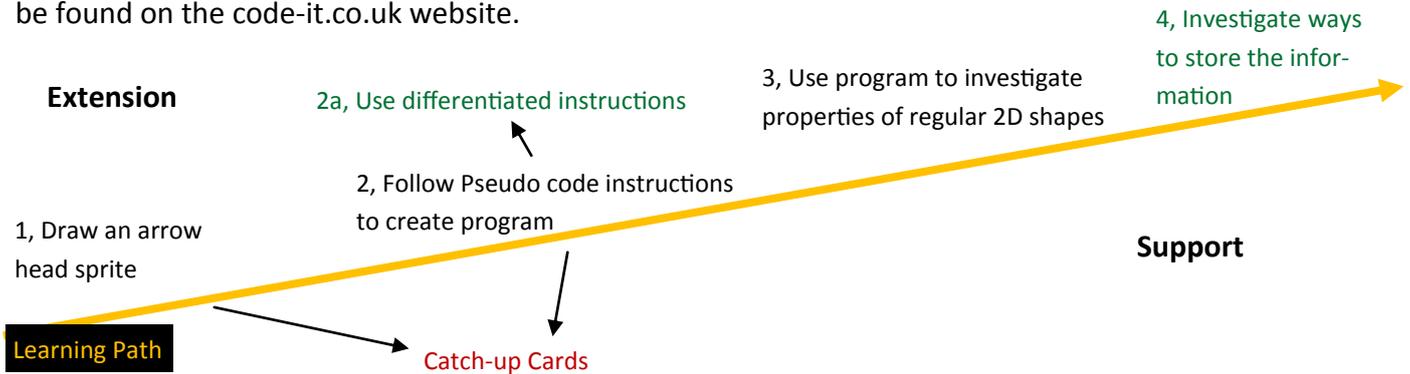
-Simple Move, turn, direction & XY coordinates blocks

-User Input into a variable

-Using variable to set number of repeats, move distance and turn angle

Maths Concepts

-Using X & Y to position a sprite

-Investigating Properties of regular 2D shapes (sides & angles)

Differentiation and Assessment for Learning This planning should be used alongside the *catch-up cards* supporting SEN pupils and the *extension cards* supporting the more able, although in this module a lot of the extension tasks can be given orally. At the beginning of each session the *learning intention sheet* is shared and the learning journey expanded through success criteria. Pupils feed their progress back to the teacher through annotating this sheet with smiley faces at the end of the lesson. Teachers can also annotate the sheet to indicate those who need more or less help in future lessons. These extra resources can be found on the code-it.co.uk website.

Extension

2a, Use differentiated instructions

3, Use program to investigate properties of regular 2D shapes

4, Investigate ways to store the information

2, Follow Pseudo code instructions to create program

1, Draw an arrow head sprite

Support

Learning Path

Catch-up Cards

1, Draw an arrow head sprite

Delete the Scratch cat by right clicking on sprite 1 and selecting delete

Left click paint new sprite

Using the straight line tool draw an arrowhead pointing right

Click to set the costume centre

Line up the centre on the middle of the straight line

Set costume center
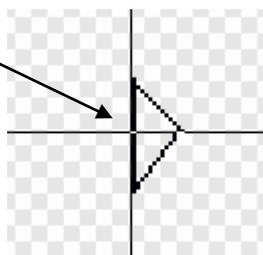
Angles of 2D Shapes P2

2, Follow Pseudo code instructions to create program

Explain to your pupils that pseudo code is a way of writing programming instructions in ordinary English. Hand out the differentiated pseudo code sheets (that can be found on the code-it.co.uk site) You may wish to point out to your middle and low ability pupils that the background colours indicates the Scratch block colours. You may wish to consider allowing middle and low ability pupils to work in pairs especially if you think reading the pseudo code may be an issue. Give pupils a chance to build the pseudo code, some may need the first step modelled. After some time, if some are really struggling support them through the use of the extension cards.

Maths Angles of 2D shapes build from pseudo code

Create three variables
length of side
number of sides
turn in degrees
Choose a start block
place sprite at x=0 y=120 (top middle)
point in direction 90 degrees
Clear all other lines
Put pen down onto the screen so it can draw
Ask the user what length of sides and use their answer to set the length of sides variable
Ask the user what number of sides and use their answer to set the number of sides variable
Ask the user what turn in degrees and use their answer to set the turn in degrees variable
Repeat the number of sides variable
    move the length of side variable steps
    turn right the turn in degrees variable

Pseudo code is a method of writing code in normal language

3, Use program to investigate properties of regular 2D shapes

As pupils look to be finishing hand them the investigation sheet and explain that the can now use their program to investigate the properties of regular 2D shapes. Can they work systematically using small 10 degree increments to start with to find the correct angles for a triangle and then work their way down the shapes. They will need to use smaller increments than 10 degrees with some shapes.

4, Investigate ways to store the information

If anyone finishes earlier challenge them to find a way to store angle, number of sides & the name of the shape in the program. They can do this using lists and ask input blocks which you will have previously used in the number machine and coin programs. A solution is available on the code-it.co.uk website.